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II. Aroclor Wildlife Project

The analytical support work for the Aroclor Wildlife Project can be divided into 4 areas.

1. Develop sensitive and specific in-hand methods for identifying Aroclor in our environment.

2. Initiate an outside toxicological test program and provide necessary analytical methodology.

3. To determine validity of methods used and the results obtained by workers in the residue area.

4. Monitor labs doing research on environmental contamination by Aroclors.

The following progress has been made in the following areas:

1. An F & M 402 High Efficiency Gas Chromatograph has been purchased and set up. This system allows two column operation and a choice of 3 detective systems - electron capture, flame ionization and micro columetric.

   The GC electron capture system is operational and has been completely evaluated with regards to Aroclor sensitivity and potential pesticide interferences using a QF1-Chrome Sorb W column.

2. The second column (DC 200 Anachrom ABS) will utilize both the flame ionization and micro columetric detectors via an infinitely variable effluent splitter. The electron capture system provides an extremely sensitive method for identifying nanogram amounts of polychlorinated biphenyls and possibly a semi-quantitative estimation of amount present. The flame ionization micro columetric detector while not as sensitive, should provide a better quantitative measure. This second system is not operational because of electronic failure and has not been completely evaluated. The characteristics of the polychlorinated biphenyls on the 2 different columns and 3 detectors will provide for their almost unequivocable identification in unknown samples. Some thin layer and column chromatographic techniques have also been investigated for the isolation of polychlorinated biphenyls from pesticides which interfere with the gas chromatographic determination. In addition to this work, Dr. Mieure has established the operating parameters necessary for the absolute identification of polychlorinated biphenyls by GC/MASS.

2. An outside toxicity study has been initiated with Industrial Bio-Test Laboratories and the necessary analytical support work completely outlined on paper. Some tissue samples are now in hand and verification of outlined procedure will begin soon. An alternate hot analytical approach using C_{14} tagged Aroclor has also been outlined on paper and is available should its use be necessary.

3. After closely reviewing the available literature, I find it difficult to dispute the identification of the interferring peaks as polychlorinated biphenyls. Still we have not actually demonstrated this on real samples in the labs. For this reason a letter to the Fish and Wildlife people at Patuxent is being drafted requesting duplicate samples of some of the tissues in which they believe they have found polychlorinated biphenyl. These samples will then be subjected to an absolute GC/MASS identification. If polychlorinated biphenyls are found, this still does not prove that Aroclors are the initial source of contamination. To help us determine if Aroclors are the actual source of contamination, the following experiments have been planned.

   a) Water solubility of Aroclor

   b) Incineration of Aroclor containing paper

   c) Analysis of air, water, and soil samples from around our manufacturing sites.

   d) Feeding studies with pesticides that might be metabolized to polychlorinated biphenyls.

4. We have visited several government agencies in Washington to discuss polychlorinated biphenyls. Trips will be planned as deemed necessary.

III. Industrial Hydraulic Fluids

MCS 790, a 190 SUS Pydraul 312 type fluid was formulated for the Japanese market. Properties are being obtained on this fluid which is similar in composition to Pydraul 135.

After typical physical properties and fire resistance are obtained, data and a small sample will be sent to Japan and pilot plant quantities blended for full scale pump tests.

Houghto-Safe 1120 - provided excellent anti-wear performance in a V105C test in the same range as Pydraul 312 and anti-wear petroleum oils.

the fluoro chloro benzenes as replacements for TCB in dielectric fluids for polypropylene capacitors.

Functional Fluids - Europe

Ruabon research will explore potentials of silicate esters as new dielectric fluids and of thin polyethylene film for capacitors.

Dielectric Fluids

Technical service requests for compatibility of materials with Aroclor have been completed for BXL and Dimitrava, Poland.

Compatibility tests with Pyroclor have been completed for Yorkshire Transformers. A used sample of Pyroclor has been tested for Civic Centre, Birmingham.

Vists have been made to ICAR (Spain), Zanussi (Italy) and Bianchi (Italy) to introduce MCS 748 (Aroclor 1242 plus Scavenger). This has also been introduced to Erie Electronic Components during a visit to Ruabon. Interest in this product has been limited so far due to our inability to provide know-how on its use.

At a meeting of BSI Committee ELE/20/2, little progress was made as I.E.C. documents were not ready, but an announcement that the scope of this body is being extended is welcome for Monsanto, since it should help to extend the acceptance of Pyroclor transformers.

During a visit to St. Louis agreement was reached with Fluids Group that Research at Ruabon should investigate silicate esters as potential dielectric fluids and explore the potential of thin polyethylene film in capacitors. Visits were also made to South Second Street to discuss dielectric measurements and to E.G.K. Plant to look at Porocel refining and in-line dielectric cell operation.

V. Aroclor Wildlife

An analysis of the analytical work which will be necessary for the Aroclor-Wildlife project has been carried out. Included were a time table for all future activities with priorities. A formal P.A. is being written in which this information will be incorporated.

A portion of the Biotest-Aroclor feeding study has been started. Several chickens are being fed Aroclor 1242, 1254, 1260, and 5460, along with two chlorinated naphthalenes (Halowax 1014, 1099) and two insecticides (Toxaphene & Tech. DDT). Tissue samples from these chickens are to be analyzed for chlorinated hydrocarbons by electron capture gas chromatography. In preparation for the arrival of the tissue samples, procedures for the isolation of the chlorinated hydrocarbons have been outlined and are presently being verified.

ED/GC analysis of tap water equilibrated with Aroclor 1242, 1248, and 1254 indicates that the solubility of Aroclor 1242 is approximately 200 parts per billion and that a stable, reproducible emulsion can be formed which contains about twice as much Aroclor. When this study is completed a more detailed memo will be issued.

Aroclor analysis of sediment samples taken from Snow Creek are also in the process of being completed. One sediment sample from the plant out-fall contained 0.25% Aroclor.

VI. Tractant Fluids

Lycoming Constant Speed Drive Test

We are investigating used MCS 757 from a constant speed drive test run at Lycoming. Traction results were excellent during the early part of the test. However, when the input speed reached about 6000 rpm, the oil pressure dropped, oil temperature increased sharply, and the test had to be stopped.

Comparison of the used fluid with new MCS 757 shows that the fluid is relatively unchanged:

	New	Used
Viscosity		
-20°F	17,968	16,171
100°F	22.2	24.0
210°F	3.68	3.82
Acid No.	.01	.02
VPC		
Appearance		Unchanged
Dicyclohexyl: Hydrogenated Dicumyl	1:6.4	1:6.9

MONS 035950

The used fluid was turbid. Centrifugation produced a small amount of metallic deposit, presumed to be wear debris.